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February 25, 2005

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APPLICATION NUMBER: *60/541,156*
FILING DATE: *February 02, 2004*
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Certified by

Jon W. Dudas

Under Secretary of Commerce
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Patent and Trademark Office

Customer No. 31013 **Docket No. 161485-00500**

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

Mail Stop Provisional Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This is a request for filing a Provisional Application for Patent under 37 C.F.R. § 1.53(c).

Inventor(s) and Residence (city and either state or foreign country):

Timothy Thomson - West Newbury, Massachusetts

For **PROCESS FOR CONTROLLING THE DENSITY AND CONFORMATION OF THE HYDROPHILIC LAYER OF A POLYURETHANE COMPOSITE**

1. ☒ 3 sheets of specification

2. ☒ A check in the amount of $80.00 is enclosed in payment of the required fee. The Commissioner is hereby authorized to charge and additional fees or credit any overpayment to Deposit Account No. 50-0540.

3. ☒ Please direct all communications relating to this application to the address of:

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4. ☒ Applicant hereby states pursuant to 37 C.F.R. § 1.27(c)(1) that Applicant is a small entity.

5. ☒ This invention was not made by an agency of the United States Government or under a contract with an agency of the United States Government.

Dated: February 2, 2004

Respectfully submitted,

By: _____
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Customer No.: 31013 Docket No.: 161485-00500

PROVISIONAL APPLICATION FOR LETTERS PATENT

Inventor: Timothy Thomson

Title: **PROCESS FOR CONTROLLING THE DENSITY AND CONFORMATION OF THE HYDROPHILIC LAYER OF A POLYURETHANE COMPOSITE**

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Background of the Invention

Thomson in US Patent 6,617,014 teaches the composition and process by which a hydrophilic polyurethane can coat a substantially open cell foam. One of the processes taught in that patent is to emulsify an aqueous phase with a hydrophilic prepolymer and then by means of a nip roller, force the emulsion into the matrix of an open cell hydrophobic polyurethane foam. After curing, the process produces a composite having the strength, structure and other aspects of the open cell polyurethane scaffold and the beneficial properties of the hydrophilic polyurethane as a coating. This is beneficial in a number of product areas including bioremediation of waste or otherwise contaminated water. Certain medical devices are also taught.

As is known the temperature at which the hydrophilic polyurethane is cured to some degree controls the density and the cell structure of the resultant coating.

Description of the Invention

It has been found that by controlling the temperature of the process immediately after application of the hydrophilic prepolymer to the scaffold and before cream time, one can control the density and the conformation of the hydrophilic layer. Specifically, if the curing foam composite is caused to enter a chamber to which is supplied live steam, the hydrophilic polyurethane forms into a low density porous surface. If cold air is pumped through the chamber a dense, nearly hydrogel layer is produced.

EXAMPLE 1

An emulsion of 1 part water to which is added 0.05% Pluronic L62 and 1 part Hypol 2002 is produced in a pin mixer and deposited on a 30ppi polyether polyurethane reticulated foam by means of nip rollers. Within 2 seconds of the first contact of the aqueous phase and the prepolymer, the composite is exposed to live steam in such a way as to

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immediately elevate the temperature of the composite to 100°C. The steam is in contact with the composite for a minimum of 15 seconds during which time it fully cures as evidenced by a lack of tackiness. Upon microscopic examination, it is determined that a porous hydrophilic coating is produced.

EXAMPLE 2

The composite is prepared as in Example 1, except that the foam enters a chamber to which is pumped air at 4°C. The composite is exposed to the cold air for 30 minutes. Since the foam is still tacky, it is understood that the hydrophilic polyurethane is not fully cured. It is allowed to cure at room temperature for an additional 30 minutes before analysis. Upon microscopic examination, it is determined that a nonporous hydrophilic coating is produced.

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